

Amendments to the Claims

Claims 1-54 (canceled)

55. (currently amended) A portable apparatus for in-field and laboratory measurement of reduced inorganic sulfur content of a sample comprising: a reaction chamber for receiving a sample to be analysed and, ~~means for introducing~~ a selective reducing agent or a precursor of a selective reducing agent that selectively converts the reduced inorganic sulfur of a sample in the reaction chamber to hydrogen sulfide, an acid reservoir for holding an acid for supply to the reaction chamber, detection means for continuously measuring the amount of hydrogen sulfide evolved by reaction of the selective reducing agent with the sample during said reaction, said detection means being selected from the group consisting of a colourimetric detector, an electrochemical gas analyzer, a UV spectrometer and an IR spectrometer, a conduit for supplying hydrogen sulfide evolved in the reaction chamber to the detection means, ~~control means~~ a controller for controlling operation of the apparatus, said controller ~~control means~~ controlling at least (a) operation of the detection means during analysis of the sample so as to measure hydrogen sulfide evolved on a real time basis as a function of time, and (b) calculation of the cumulative concentration of hydrogen sulfide as a function of hydrogen sulfide concentration and flow rate, and a trap for selectively removing hydrogen sulfide from an exit gas stream leaving the apparatus.

56. (currently amended) An apparatus as set forth in claim 55 further comprising a conduit ~~means~~ connecting the acid reservoir to the reaction chamber and wherein said ~~control means~~ controller controls transfer of acid from the acid reservoir to the reaction chamber such that a predetermined amount of acid is supplied to the reaction chamber.

57. (currently amended) An apparatus as set forth in claim 55 further comprising signaling ~~means~~ device for signaling when evolution of hydrogen sulfide has ceased or reduced below a predetermined level.

58. (previously presented) An apparatus as set forth in claim 57 wherein the detection means detects when evolution of hydrogen sulfide has ceased or reduced below a predetermined level and whereafter the controller issues a signal to an operator to signal that the evolution of hydrogen sulfide has ceased or reduced below a predetermined level.

59. (previously presented) An apparatus as set forth in claim 55 further comprising a pump for delivering acid from the acid reservoir to the reaction chamber, and wherein operation of the pump is controlled by the controller.

60. (currently amended) An apparatus as set forth in claim 55 further comprising ~~heating means~~ a heater for heating the reaction chamber.

61. (currently amended) An apparatus as set forth in claim 60 wherein operation of the ~~heating means~~ heater is controlled by the controller.

62. (previously presented) An apparatus as set forth in claim 55 further comprising a source of inert or non-reactive gas for supply to the reaction chamber, and a conduit for supplying the inert or non-reactive gas to the reaction chamber.

63. (previously presented) An apparatus as set forth in claim 62 wherein the inert or non-reactive gas carries evolved hydrogen sulfide from the reaction chamber to the detection means.

64. (previously presented) An apparatus as set forth in claim 62 wherein supply of the inert or non-reactive gas to the reaction chamber is controlled by the controller.

65. (previously presented) An apparatus as set forth in claim 55 wherein the selective reducing agent is selected from the group consisting of Cr(II), and Sn(II).

66. (previously presented) An apparatus as set forth in claim 65 wherein the selective reducing agent is acidified chromous chloride and the selective reducing agent is formed by mixing chromous chloride with hydrochloric acid in the reaction chamber.

67. (currently amended) A portable apparatus for in-field and laboratory measurement of reduced inorganic sulfur content of a sample comprising: a reaction chamber for receiving a sample to be analysed and ~~means for introducing~~ a selective reducing agent or a precursor of a selective reducing agent that selectively converts the reduced inorganic sulfur of a sample in the reaction chamber to hydrogen sulfide, an acid reservoir for holding an acid, a conduit ~~means~~ means connecting the acid reservoir to the reaction chamber, a ~~heating means~~ heater for heating the reaction chamber, a ~~detection means~~ detector for continuously measuring the amount of hydrogen sulfide evolved by reaction of the selective reducing agent with the sample during said reaction, a conduit for supplying hydrogen sulfide evolved in the reaction chamber to the ~~detection means~~ detector, a source of inert or non-reactive gas for supply to the reaction chamber and a conduit for supplying the inert or non-reactive gas to the reaction chamber, a trap for selectively removing hydrogen sulfide from an exit gas stream leaving the apparatus, and a computer ~~control means~~ for controlling operation of the apparatus, said computer ~~control means~~ being operative, upon initiation of an analysis by an operator, to transfer acid from the acid reservoir to the reaction chamber, to initiate operation of the heater ~~heating means~~, to initiate operation of the detector ~~means~~, to monitor a level of evolution of hydrogen sulfide from the reaction chamber and to initiate supply of the inert or non-reactive gas to the reaction chamber, so as to measure hydrogen sulfide evolved on a real time basis as a function of time, said computer ~~control means~~ being further operative, upon detection that evolution of hydrogen sulfide has ceased or decreased to below a predetermined level, to turn off the heater ~~heating means~~, to disengage the detector ~~detection means~~, to interrupt the supply of inert or non-reactive gas and to signal that evolution of hydrogen sulfide has ceased or decreased to below a predetermined level.

68. (previously presented) An apparatus as set forth in claim 67 wherein the selective reducing agent is selected from the group consisting of Cr(II), Sn(II) and Hg(II).

69. (previously presented) An apparatus as set forth in claim 68 wherein the selective reducing agent is acidified chromous chloride and the selective reducing agent is formed by mixing chromium with hydrochloric acid in the reaction chamber.

70. (previously presented) An apparatus as set forth in claim 67 wherein the inert or non-reactive gas is nitrogen.

71. (currently amended) An apparatus as set forth in claim 67 wherein, upon initiation of an analysis run by an operator, the computer ~~control means~~ is operative to sequentially initiate supply of the inert or non-reactive gas to the reaction chamber to purge the apparatus, initiate transfer of acid from the acid reservoir to the reaction chamber, and initiate operation of the heater ~~heating means~~, said ~~control means~~ computer also initiating operation of the detector ~~detection means~~.

72. (currently amended) An apparatus as set forth in claim 67 further comprising a condenser interposed between the reaction chamber and the detector ~~detection means~~, and a coolant supply ~~means~~ for supplying coolant to the condenser, and wherein the computer ~~control means~~ controls supply of coolant to the condenser.

73. (currently amended) An apparatus as set forth in claim 67 wherein said detector ~~detection means~~ is selected from the group consisting of a colourimetric detector, a turbidimetric detector, a gravimetric detector, an electrochemical gas analyzer, a UV spectrometer and an IR spectrometer.